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 TI **Peptoid**-based foldamers: Application of synthetic,
 sequence-specific polymers for biological mimicry of lung
surfactant proteins.
 AU Wu, Cindy W.; Lee, Ka Yee; Barron, Annelise E.
 CS Chemical Engineering Department, Northwestern University, Evanston, IL,
 60208-3120, USA
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 AB -Foldamers' are non-natural, sequence-specific oligomers designed to
 mimic
 the folding properties of natural polypeptides. We are designing protein
 mimics that are based on a class of synthetic, sequence-specific
 foldamers
 called -polypeptoids,' i.e., N-substituted glycine polymers, whose
 advantages for biol. mimicry include their ease of synthesis, protease
 stability, and low immunogenicity. Using automated solid-phase
 synthesis,
 we produce polypeptoids with specific sequences of biomimetic,
 proteinogenic sidechains. Despite an absence of chiral centers and
 hydrogen-bond donors in the polymer backbone, some polypeptoid sequences
 adopt stable helixes in soln. that exhibit intense CD spectra resembling
 those of peptide alpha-helixes. Along with studying the folding
 propensities of biomimetic polypeptoids, we have focused on designing
peptoid-based mimics of the helical lung **surfactant**
 proteins SP-B and SP-C, as safe, bioavailable alternatives to
 animal-derived **surfactants**. Whereas natural SP-C peptide
 misfolds and aggregates in soln., **peptoid**-based, helical SP
 mimics are stable in soln. and show promising biophys. properties as
 detd.
 by CD, surfactometry, and fluorescence microscopy.